**NATURAL RESOURCES CONSERVATION SERVICE**

**CONSERVATION PRACTICE STANDARD**

# WOODLAND IMPROVEMENT

**(Acre)**

**CODE 666**

## DEFINITION

Removing undesirable trees, shrubs, or vines from wooded areas.

## PURPOSE

To fully use the potential of a site; to maintain plant cover for soil protection; to improve stand composition by leaving the best trees spaced for best growth; to improve forage production on grazeable woodland; and to improve the natural beauty, wildlife, or recreation values of an area.

## CONDITIONS WHERE PRACTICE APPLIES

In overstocked woodlands or where desirable trees are overtopped by less desirable trees, shrubs, or vines; or where removing part of a stand will improve stand quality, forage production, or the recreation, wildlife, aesthetic, or hydrologic values of an area.

## SPECIFICATIONS

**Species to Favor**

1. Refer to Field Office Tech Guide, Section II-Forestland Interpretations, to select desirable species for the woodland site.
2. Priority shall be given to improving sites having site indices of 55 or greater for the species selected.
3. Generally trees to favor in Nebraska include: Ponderosa pine, black walnut, eastern cottonwood, green ash, hackberry, bur oak, northern red oak, hickory, silver maple, eastern redcedar, and basswood.

**Improvement Methods (TSI - Timber Stand Improvement)**

1. Weeding - Weeding is the removal of overtopping and strongly competing trees, brush, or other undesirable growth from stands of desirable species (crop trees). Included with weeding is liberation cutting (removal of wolf trees) and vine removal.
   a. Weeding will be specified only if there are a sufficient number of desirable species present to result in an adequately stocked stand, approximately 150-200 desirable trees per acre.
   b. To protect the soil and train the crop trees, remove only the growth immediately surrounding the crop trees and leave all vegetation not directly interfering with crop tree growth. In a space of 2 feet surrounding the crop tree, cut all growth that reaches to one-third or more the height of the crop tree and, in a space of 4 feet, all vegetation taller than the crop tree.
   c. Liberation cutting is recommended when there are large excessively limby “wolf” trees in the stand which are overtopping desirable seedling or sapling tree species. There should be a sufficient number of desirable trees underneath to benefit from this type of release.
2. Methods for Weeding
   a. Cutting and treating with a herbicide: Cut and treat the stump with a chemical herbicide best suited to kill the species. Apply chemical immediately after cutting in accordance with directions given on label. In some stands stumps may be

allowed to sprout back where low habitat is lacking or desired.

b. Girdling: Girdle the tree about breast height, being careful to cut clear through the cambium layer all the way around the tree. Another girdling 4-6 inches below the first cut can be done to be sure of an effective kill. Girdling is an alternative for killing a few large weed or wolf trees larger than 12 inches in diameter (usually done with chain saws).

c. Frilling and treating with a herbicide: Frill with an axe at a convenient height above ground. Make cuts all the way around tree then immediately apply chemical herbicide in accordance with directions given on label. All trees frilled should be treated with a herbicide. December 15 to March 15 is best period for frilling and herbicide treatment. Large trees may be girdled 2 inches deep with chain saw and treated.

**Thinning (Pre-commercial)**

Thinning is cutting trees from an overstocked stand composed of desirable species not of commercial size to increase the growth rate of the remaining trees. Proper space varies depending on species, purpose of management, and quality of the site. Types of trees usually removed in improvement thinnings are as follows:

- Dead/dying, insect or disease infested trees.
- Deformed (crooked), fork topped, or damaged trees (fire, lightning, porcupine).
- Suppressed and codominant desirable trees to attain proper spacing.

1. Ponderosa Pine Stands - Western NE

   For pine stands under 6 inches diameter, thin to 10-12 feet spacing. For pine stands over 6 inches diameter the D+9 spacing rule is used, D being the average stand diameter.

| Ave. Diameter | D+9 feet spacing |
|---|---|
| 6 | 15 |
| 8 | 17 |
| 10 | 19 |
| 12 | 21 |

   If woodland grazing is considered, add 1-3 feet to the spacing for site indices below 55.

   Time of year - For pine stands, when possible, thinning should be done in the fall and early winter months to avoid buildup of Ips (pine engraver) beetles in the slash and subsequent damage to the residual stand by beetles killing “leave” trees. If thinned at other times of the year, the slash should be lopped and scattered to a maximum of 18 inches off the ground and left to decompose on the forest floor.

2. Hardwood Stands

   For stands under a 6-inch diameter, thin to 12 feet. One general rule-of-thumb for hardwood stands is to leave 5-8 feet of open space in at least two sides of the crown of the remaining trees. For black walnut stands, allow 10 feet growing space between crowns.

   In addition, the woodland information stick has spacing for types of hardwood stands. Another method if the stand is uniform in diameter is the “diameter-times-two” rule. With this method, the average diameter in inches is multiplied by two; this is the number of feet to leave between the stems of the remaining trees.

   a. Pruning is also considered to be a timber stand improvement practice on selected high value crop trees to increase the quality of wood produced for sawlogs, veneer, etc. Black walnut, for example, will need pruning to get a desirable veneer log. Flush pruning is no longer an accepted practice. Prune conifers and hardwoods just outside the branch collar, not flush to the main stem (see diagram).

      Do not remove more than one-third of the tree’s live crown in any one year.

      Not all branches to be pruned should be removed at one time and pruning is best done in the late winter before bud break. Pruning should continue annually until the desired clear length is obtained. Limbs to be removed should be pruned before they reach 2 inches in diameter and generally, trees should be pruned before they reach 8 inches in diameter. This practice comes under WOODLAND

PRUNING (660) in Section IV of the Field Office Technical Guide.

b. Heavy accumulation of thinning slash should be lopped and scattered close to the ground, piled for wildlife, or burned away from crop trees that are left. Check local and state laws when slash is burned or is near a public road.

**Wildlife Considerations**

1. Leave a selected few older cull trees for wildlife "den" trees. Leave brush piles for wildlife.
2. The edge or border between woodland and field should be irregular, rather than straight, again saving den trees, tall snags, shrubs, and vines that bear nuts and fleshy fruits. A 50-foot strip could be left untreated on the edge of the stand.
3. Leave vines, nut trees, and shrubs throughout the stand when they are not interfering with the growth of trees having commercial value.

**References**

University of Missouri AG Guide, Increase Woodland Products through TSI.

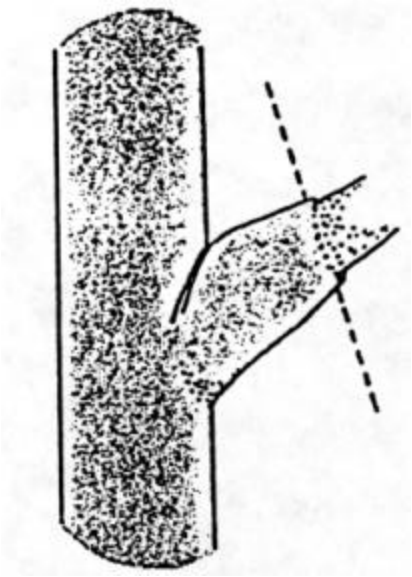
Top of Ozarks RC&D, Woodland Resource Guide, 1988.

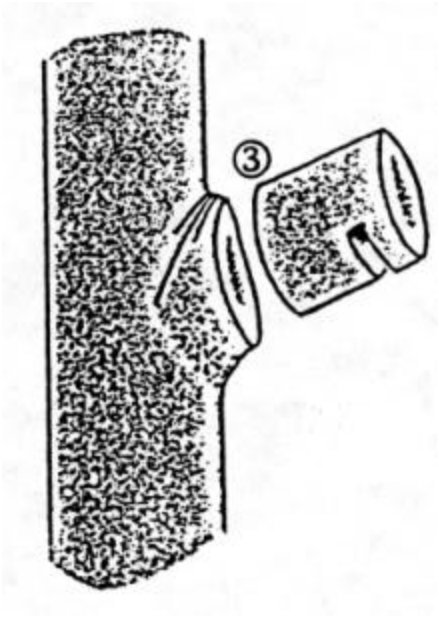
Pennsylvania State Extension Bulletin, Timber Sales & Wildlife, 1981.

Colorado State Forest Service, Landowner Guide to Thinning.

Pruning a Dead Branch

A dead branch stub that has a collar of live wood should be cut just at the outer edge of the collar (swollen area where one branch meets another.






Pruning a Live Branch

Remove a large limb by making three cuts:
1.Undercut 12” to 24” from the branch collar (A).
2.Make a top cut all the way through the branch, within 1” of the undercut.